**Mathematical Model for Transient Analysis of variable Speed frequency controlled Induction Motor**

**Abstract**

*In this paper, the mathematical model for variable speed frequency controlled induction motor is developed. Different mathematical models with constant voltage and frequency have been used over the years to solve the different problems associated with induction motors. These models cannot be applied when driven by variable speed drives, when the machine has impedance unbalance or subjected to certain forms of unbalance power supply. Nowadays, variable speed frequency controlled with induction motors are using in transportation, pumps, compressors, ventilators, machine tools, hybrids or electrical vehicles, etc. When they are used, this is an important role to be correct finding the parameters in the stator windings during the condition of the inverter unbalance output voltages for motor designing. This model can be used with the inclusion of unbalance power supply but also considered the computational economy of the complex variable models. Finally the mathematical model with the saturation effect and steel losses is developed especially for variable speed frequency controlled induction motor.*